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| 09/197,499 | 11/23/1998 | KOSHIRO SHIMAZU | 03/60-52794. | 1327 |

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| EXAMINER |
|---|
| NGUYEN, NGOC YEN M |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1754 | 17 |

DATE MAILED: 12/18/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

MF-17

# Office Action Summary

| Application No. | Applicant(s) |
|---|---|
| 09/197,499 | Shimazu et al |
| **Examiner** | **Art Unit** |
| N. M. Nguyen | 1754 |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *three* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) ☒ Responsive to communication(s) filed on *Sep 27, 2001*.

2a) ☒ This action is **FINAL.** 2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

**Disposition of Claims**

4) ☒ Claim(s) *1, 5, 8, and 11-20* is/are pending in the application.

4a) Of the above, claim(s) *11-17* is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1, 5, 8, and 18-20* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirement.

**Application Papers**

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.

12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. § 119**

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

**Attachment(s)**

15) ☐ Notice of References Cited (PTO-892)
16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____
18) ☐ Interview Summary (PTO-413) Paper No(s). _____
19) ☐ Notice of Informal Patent Application (PTO-152)
20) ☐ Other:

## DETAILED ACTION

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 5, 8, 19 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Diffenbach et al (3,719,732).

Diffenbach '732 discloses a process for producing active catalyst particles comprising:

providing a melt consisting essentially of an alloy selected from the group consisting of Al-Ni, Al-Co, Al-Fe and Al-Cu;

forming said melt into discrete droplets;

simultaneously shaping and cooling said droplets by dropping said droplets into a vaporizable liquid (i.e. quenching); and the vaporizable liquid is water (note claim 5);

leaching at least a part of said aluminum content from said shaped particles so that the shaped active catalyst contains at least 10% of the non-aluminum component (note claim 1).

In Example 3, the Ni-Al composition is disclosed to be 40 Ni - 60 Al (note Table in column 6) or (Ni:Al = 1:1.5). This range is well within the claimed range of 1:2 to 2:1. The particles of the quenched alloy have a diameter of from about 1/4 to ½ inch (= 6.35-12.7 mm) (note column 5, lines 69-70). This range is also well within the claimed range of 1-15 mm.

For claim 19, Diffenbach '732 discloses that the alloy further contains from about 1 to 15 percent of a promotional material selected from the group consisting of chromium and molybdenum (note claim 4).

The product of Diffenbach '732 anticipates the claimed product.

In the event that the process steps as disclosed in Diffenbach '732 is not the same as the process steps required in the instant claim 5, any difference imparted by the product by process limitations would have been obvious to one having ordinary skill in the art at the time the invention was made because where the examiner has found a substantially similar product as in the applied prior art the burden of proof is shifted to the applicant to establish that their product is patentably distinct not the examiner to show that the same process of making, see In re Brown, 173 U.S.P.Q 685, and In re Fessmann, 180 U.S.P.Q. 324.

Claims 1, 20 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Schuetz '694.

Schuetz '694 discloses that activated metal catalysts are known as Raney catalysts in the chemical engineering field. They are used mainly in the powdered form in a large number of reactions for hydrogenating organic compounds. These powdered catalysts are prepared from an alloy of a catalytically active metal and another alloying component which is leachable in alkalis. The Raney process metals used are mainly Ni, Co, Cu or Fe. The alloying component which is mainly used is Al (note column 1, lines 30-41). This so called Raney alloy is first finely milled according to Raney's method. Then the aluminum is completely or partially removed by leaching with alkalis such as, for example, caustic soda solution (note column 1, lines 42-50).

The powder Raney catalyst as disclosed in Schuetz '694 anticipates the claimed product.

Alternatively, any difference imparted by the product by process limitations would have been obvious to one having ordinary skill in the art at the time the invention was made because where the examiner has found a substantially similar product as in the applied prior art the burden of proof is shifted to the applicant to establish that their product is patentably distinct not the examiner to show that the same process of making, see In re Brown, 173 U.S.P.Q 685, and In re Fessmann, 180 U.S.P.Q. 324.

Claims 1, 18, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Diffenbach '732 in view of Lepper et al (4,520,211).

Diffenbach '732 discloses a process for producing active catalyst particles as stated in the above rejection. Diffenbach '732 teaches that the product can be conveniently used as fixed bed catalyst in contrast to the commonly used powdered catalyst which require the addition of a filtering step fro removal from a product stream (note column 1, lines 53-65).

The difference is Diffenbach '732 does not disclose the step of crushing the catalyst particles.

Lepper '211 teaches that in a process of making polyhydric alcohols (i.e. sugar alcohols) by the hydrogenation of carbohydrates, a "catalyst solid bed" is preferred. The catalyst solid bed is defined as stationary arrangement of the catalyst in the reactor in the manner of a packed bed (note column 2, lines 47-52), thus the catalyst solid bed in Lepper is considered the same as a fixed bed catalyst. Lepper further discloses that the particle size of the catalyst employed in lumpy form may vary widely. On the one hand, the catalyst particles should not be so small that the flow resistance of the catalyst solid bed greatly hinders the through flow of the mixture of hydrogen and aqueous carbohydrate solution and necessitates too high a pressure. On the other hand, the maximum dimensions of the lumpy catalyst are given by the reactor geometry. As a rule, the particle size of the catalyst lumps, i.e. the diameter and/or length of the catalyst particles, will be selected so that it is in the range of from about 2 to 10 mm (note column 3, lines 16-32). This range overlaps the claimed range. The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been

held to be a prima facie case of obviousness, see In re Malagari, 182 U.S.P.Q. 549. It is noted that the in Lepper '211, the catalyst is a ruthenium-containing catalyst, not a Raney catalyst, however, only the physical size of the catalyst (not the composition of the catalyst) has direct impact on the flow resistance, etc., as discussed above, for the hydrogenation process.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to slightly reduce the particle size of the product of Diffenbach in order to obtain a more desirable particle size range for a fixed bed, as suggested by Lepper '211.

Claims 1, 5, 8-10, 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schuetz et al (5,536,694) in view of Raney (1,628,190) and optionally further in view of Richter (3,673,116) and Lepper '211.

Schuetz '694 discloses that activated metal catalysts are known as Raney catalysts in the chemical engineering field, they are used mainly in the powdered form in a large number of reactions for hydrogenating organic compounds. These powdered catalysts are prepared from an alloy of a catalytically active metal and another alloying component which is leachable in alkali. The catalytically active metals used are mainly Ni, Co, Cu or Fe. The alloying component which is mainly used is aluminum (note column 1, lines 30-41). Schuetz '694 further teaches that powder catalysts have the disadvantages that they can only be used in batch processes and have to be isolated after the catalytic reaction by time-consuming filtration of the reaction media. Various processes for preparing molded items have therefore been disclosed which lead to activated metal

fixed bed catalysts after extraction of the aluminum. Thus, for example, coarse particulate, i.e. only coarsely milled, Raney alloys are available which can be activated by treatment with caustic soda solution (note column 1, lines 51-60). When coarse particulate is desired to be used in fixed bed catalyst, it would have been obvious to one of ordinary skill to remove any particles with undesirable size before activating the Raney alloy.

Thus, Schuetz '694 fairly teaches that both the powder form and the coarse particulate form of Raney catalyst are known in the art. They can be formed by finely or coarsely milled Raney alloys. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to further pulverize the coarse particles to obtain finer particles when powder catalyst is desired. It should be noted that in Schuetz '694, both powder catalyst or coarse catalyst can be used.

For claims 1, 5 and 20, "up to 15%" of Mo and/or Sn includes zero. For claims 18, 19, Schuetz' 694 discloses that it is known in the art to include promoters, such as chromium, iron, cobalt, tantalum, titanium and/or molybdenum and also metals from the platinum group, up to 15%, in the Raney catalysts to influence their catalytic properties (note paragraph bridging columns 5-6).

The difference is Schuetz '694 does not specifically disclose the process of making the Raney alloys even though Schuetz '694 does disclose that such alloys are known in the art.

Raney '190 discloses a method of producing metallic nickel in a catalytic state such as may be used in the hydrogenation of oils, fats, waxes and the like (note page 1, lines 5-7). The process

comprises the steps of alloying metallic nickel with metals such as silicon and aluminum in various proportions, and then dissolving the aluminum and silicon from the alloy by means of a solvent which will not attack the nickel, whereupon the nickel remains in a finely divided state (note page 1, lines 8-13). The alloying is carried out by melting the nickel, aluminum and silicon either separately, or together, cooling the melt and pulverizing the solidified alloy (note page 1, lines 32-34). Raney '190 further discloses that the nickel aluminum alloy may be either very finely pulverized or it may be broken in pieces the size of peas or smaller. In either condition, the alloy may be treated with caustic soda or the aluminum removed with the use of some other solvent. In case the larger pieces are used, the nickel is left in a more or less spongy and porous state, somewhat similar to a cinder, and for certain classes of work is necessary and desirable to have the catalyzer in this condition (note page 1, lines 81-92). Raney '190 further discloses that the alloy can have 10-85% nickel and 90-15% aluminum (note page 1, lines 74-77). This range would create a Ni:Al weight ratio that overlaps the claimed range. The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, see In re Malagari, 182 U.S.P.Q. 549.

Optionally, Richter '116 can be applied to teach in the well known process of making Raney catalyst, "cooling" is quenching, or at least cooling is preferred to be quenching, note in Example 1, "cooled" is used and in Example 2, "quenching" is used. Also, Richter discloses that

it was found beneficial to cool rapidly the Raney alloy produced by melting by excluding air, since the fine crystalline texture of the Raney alloy which occurs during the quenching of the melt, is easy to homogenize (note column 2, lines 39-43).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the known Raney process such as the process disclosed in Raney '190 which comprises the steps of melting , cooling or quenching, pulverizing, to produce the Raney alloy in the process of Schuetz '694 and to only coarsely pulverize the alloy in order to use coarse particles in a fixed bed as disclosed in Schuetz '694.

Optionally, Lepper '211 can be applied as stated in the above rejection to teach the desired particle size for a fixed bed catalyst used in a hydrogenation process.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to coarsely milled the Raney alloy as disclosed in Schuetz '694 within the range suggested by Lepper '211 because such range is desired for a fixed bed catalyst in the hydrogenation process.

Applicant's arguments filed September 27, 2001 have been fully considered but they are not persuasive.

In view of Applicants' amendment, the rejections are substantially revised. The rejections over the product disclosed in the preferred embodiment of Schuetz are withdrawn in view of

Applicants' amendment and argument. However, the rejections over the product disclosed in the prior art portion of Schuetz are maintained.

Applicants argue that Schuetz '694 fails to teach or suggest that the powder catalyst is obtained from the already used catalyst as a raw material.

Again, Applicants' claims are drawn to a powder Raney catalyst, any difference imparted by the product by process limitations would have been obvious to one having ordinary skill in the art at the time the invention was made because where the examiner has found a substantially similar product as in the applied prior art the burden of proof is shifted to the applicant to establish that their product is patentably distinct not the examiner to show that the same process of making, see In re Brown, 173 U.S.P.Q 685, and In re Fessmann, 180 U.S.P.Q. 324. Applicants have not provided any evidence to show that the powder catalyst which is produced from the already used catalyst as raw material is different from the powder catalyst which is produced by the process of Raney '190.

Applicants argue that Schuetz disclose is a catalyst manufactured by mixing a catalyst alloy powder with a catalyst metal powder playing a role as a binder and sintering it without melting the metal components. It is not a catalyst that is obtained by melting a catalyst raw material as in the claimed invention.

It should be noted that under the background (or prior art portion), Schuetz '694 does disclose that powder Raney catalyst and coarse particulate Raney catalyst are both known. The

catalysts are produced from Raney alloy and Raney '190 is applied to teach the conventional method of forming Raney alloy and catalysts therefrom, either in fine or coarse particles.

Applicants argue that Raney fails to teach or suggest that the quenching is a cooling method of the melted catalyst alloy and that a used catalyst is capable of being re-utilized.

As stated in the above rejection, Richter '116 can be applied to teach that cooling is quenching or at least is preferred to be quenching in the process of producing Raney catalyst. For the re-use of used catalyst, note the reason stated above.

Applicants argue that the composition of the catalyst in Richter is different than the alloy of the claimed product.

Richter is only applied to teach that in the process of making Raney alloy and catalyst, quenching is the preferred method of cooling.

Applicants argue that Diffenbach intends to obtain a catalyst in a distorted shape.

Applicants' claims do not require any particular shape for the product. It should be noted that the process steps disclosed in Diffenbach is the same as those recited in Applicants' claims.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Ngoc-Yen Nguyen whose telephone number is (703) 308-2536. The examiner is currently on a part time schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Steve Griffin, can be reached on (703) 308-1164. The fax phone number for this Group is (703) 872-9311 (for OFFICIAL After Final amendment only) or (703) 872-9310 (for all other OFFICIAL faxes). UNOFFICIAL fax can be sent to (703) 305-6078.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

N. M. Nguyen
December 16, 2001

N. M. Nguyen
Primary Examiner
Art Unit 1754